(No Model.)

# P. M. PFEIL.

## SAND SEPARATING AND WASHING MACHINE.

No. 324,159. Patented Aug. 11, 1885.

Fig. 1.

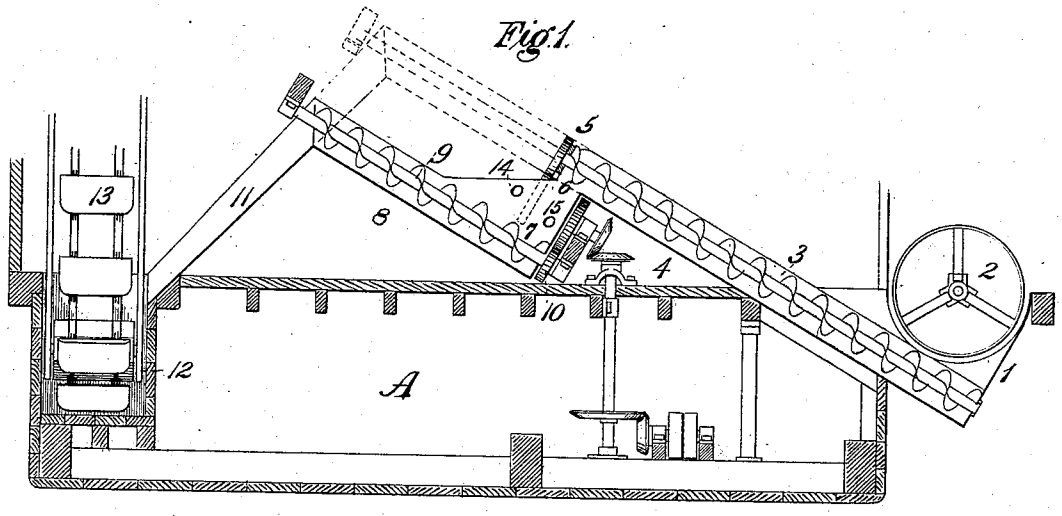
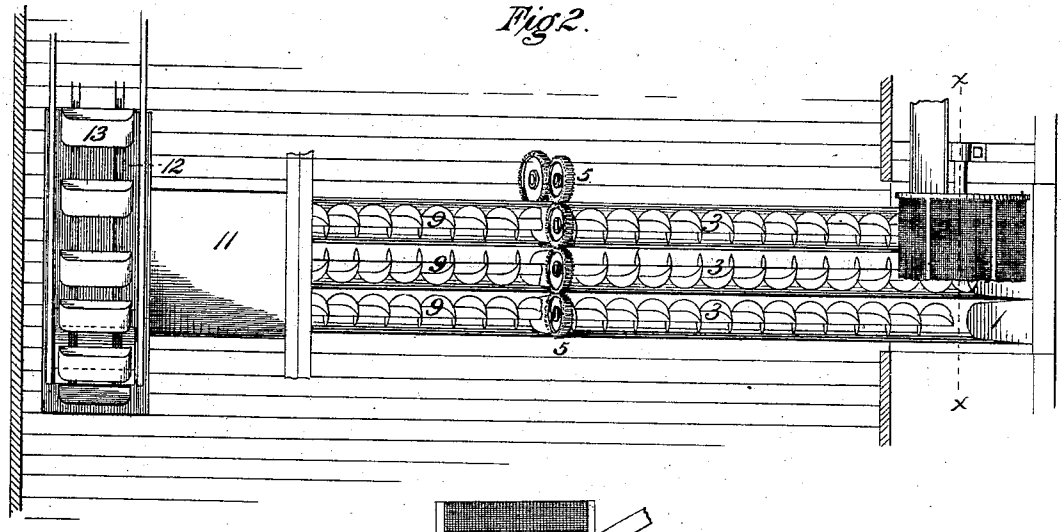



Fig. 2.



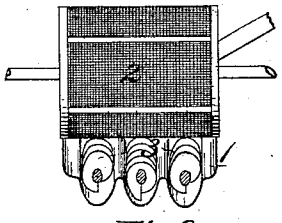




Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## SAND SEPARATING AND WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 324,159, dated August 11, 1885,

Application filed April 25, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP M. PFEIL, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Sand Separating and Washing Machines, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a transverse sectional elevation of a boat provided with my improved sand washer and conveyer. Fig. 2 is a top plan view of the same. Fig. 3 is a section in the line *x x*, Fig. 2.

The invention herein described relates to certain improvements in machines for separating and washing sand as collected from the bottoms and bars of rivers, &c.; and the object of said invention is to provide for a more complete and thorough separation and cleansing of the sand from the impurities collected therewith; and to these ends my invention consists in the construction and combinations of parts, all as more fully hereinafter described and claimed.

In an application, No. 163,385, of even date herewith, are shown and described certain improvements in sand separating and washing machines, the prominent characteristic of said machine being the separation and washing of the sand in an open unconfined body of water; and in said application the collecting, separating, and cleansing, and the receiving and delivering devices are all shown and described as located on one side of the boat; but in that arrangement of these devices or machines such cleansing of the sand as is necessary for some purposes cannot be readily effected.

In order to avoid the above-mentioned difficulties the sand-catching pan 1, in lieu of conforming to the shape of the revolving screen, is so constructed as to form a basin of considerable capacity below the revolving screen 2, as shown in Fig. 1. The sides of this basin are inclined toward each other, so as to cause the sand to be deposited or collected in such condition as to be acted on by the screw-conveyers 3. These conveyers 3 are arranged along one of the inclined sides of the basin, said side being provided with a trough-like extension, 4, projecting within the hull A of the boat, as clearly shown, and the trough-extension and side are provided with grooves which will partially inclose the conveyers, as shown in Fig. 3. These conveyers—the number employed being dependent upon the length of the screen which regulates the width of the sand-catching pan and the diameters of the conveyers—are journaled at their lower ends in the outer side of the sand-pan, and at their upper ends in the end of the trough-extension 4. The ends of the shafts of the conveyers projecting through the end of the trough 4 are provided with intermeshing-gears 5, said train of intermeshing-gears being driven through a suitable system of shafts and gears from a prime motor located in the boat. The bottom of the trough 4 is cut away near its upper end, as shown at 6, for the discharge of the sand carried up the trough 4 by the screw-conveyers 3, and below this discharge-opening 6 is located the basin 7, similar in construction to the pan 1, except that its ends are not cut away semicircularly. In this basin 7 and its grooved trough-extension 8 are located the screw-conveyers 9, having their shafts journaled in the lower side of the basin and in the end of the trough, the lower ends of said shafts being provided with intermeshing-gears 10, said train of gears being driven from the same power as the train of gears 5. The sand is carried up through the trough 8 by the conveyers 9 and discharged into the chute 11, whence it passes into the sand-box 12, and from this sand-box it is raised by the elevator-buckets 13 and discharged through a chute (not shown) into a flat or other suitable receptacle outside of the boat. The basin 7 is provided with a supply-pipe, 14, and an outlet-pipe, 15, for the supply and discharge of water to and from the basin 7, thereby providing for a further washing of the sand in said basin, the lower ends of the conveyers 9 acting as agitators to facilitate the removal of all impurities.

The screen 2 is constructed in a manner similar to that described in the application above referred to—*i. e.*, of end bands or rims, and a cylinder of wire-netting supported on said bands or rims, but the radial wings are omit-

ted, the sand being removed from the pan 1 by the conveyers, as above stated. The ends of the pan are cut away to conform to the contour of the bands 16.

The screen 2 and pan 1 are angularly arranged with reference to the surface of the water, and are similarly submerged below the surface, as stated in said application—*i. e.*, the lower portion of the screen being submerged for about three-quarters of the length of the screen—thereby providing for the operation of the screen in an unconfined body of water.

The boat is provided with suitable dredging apparatus and chutes for the collection of the sand and its discharge into the revolving screen.

If desired, only one set of conveyers may be employed for transferring the sand from the pan below the screen to the sand-box 12, as represented in dotted lines in Fig. 1. As the conveyers rotate, they carry up the mingled sand and water from the pan or basin; but the water, after being carried up a short distance, will flow back, carrying with it mud, clay, and other impurities, leaving the sand clean and free from impurities.

I claim herein as my invention—

1. In a sand-washing machine, a cylindrical screen arranged to revolve with its lower part in the surface of an open unconfined body of water, such screen being slightly inclined downward toward its delivery end, and having an unobstructed discharge, in combination with a sand-catching pan beneath said screen, and rotary screw-conveyers for removing the sand from the pan, substantially as set forth.

2. In a sand-washing machine, a cylindrical screen arranged to rotate with its lower part partially submerged below the surface of a body of water, in combination with a sand-catching pan beneath said screen, a sand box or receptacle, and rotary screw-conveyers for transferring the sand from the pan to the box, substantially as set forth.

3. In a sand-washing machine, a cylindrical screen arranged to rotate with its lower part partially submerged below the surface of a body of water, in combination with a sand-catching pan beneath said screen, a sand box or receptacle, rotary screw-conveyers for transferring the sand from the pan to said box, and a sand-washing basin arranged intermediate between the pan and box, substantially as set forth.

In testimony whereof I have hereunto set my hand.

PHILIP M. PFEIL.

Witnesses:
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